

### REMARKS

By this Amendment, claims 7 and 21 are amended. Claims 8-13 and 22-27 remain in the application. Thus, claims 7-13 and 21-27 are active in the application. Reexamination and reconsideration of the application are respectfully requested.

In item 3 on page 3 of the Office Action, claims 7-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Browne et al. (WO 92-22983) in view of Kikuchi et al. (U.S. 6,577,812).

Without intending to acquiesce to this rejection, independent claims 7 and 21 are amended to more clearly illustrate the marked differences between the present invention and the applied references. Accordingly, the Applicants respectfully submit that claims 7 and 21 are patentable over the applied references for the following reasons.

Claims 7 and 21 each recite a remaining recordable time calculation apparatus for calculating a remaining recordable time of a recording medium. In particular, claims 7 and 21 are each recited as calculating the remaining recordable time of a recording medium by using the following formula.

**remaining recordable time = [(capacity of recording medium –  
estimate error value)/(standard bit rate)] – running time**

The present invention provides that the fixed estimate error value and the fixed standard bit rate are prestored in a storage means or a storage unit. In particular, as described in lines 13-16 on page 12 of the substitute specification:

FIG. 3 represents the contents of calculation parameters 300 that are held in the storage unit 17. These are two kinds of calculation parameters, a time conversion parameter 31 and an estimate error value 32. The above parameter information is **initially stored in the storage unit 17 at the time of the shipment.** (emphasis added)

Accordingly, the present invention clearly provides that the time conversion parameter (standard bit rate) is a prestored fixed value. The Examiner contends, however, that the standard bit rate of the present invention is not a fixed value. In the May 17, 2006 Advisory Action, the Examiner referenced lines 17-18 on page 12 of the substitute specification, which provides “The time conversion parameter 31 signifies the average

size of a given length of a video stream after compression.” The Applicants respectfully submit that the Examiner has mistakenly interpreted lines 17-18 on page 12 of the substitute specification as precluding the standard bit rate from being a prestored fixed value.

However, as further described in lines 18-26 on page 12 of the substitute specification, the standard bit rate shows the amount of GBs obtained by compressing a video stream whose running time is one minute, where the running time signifies a time period for which the video stream is produced. For instance, 0.05 GB/min means that a one minute length video stream is compressed to be 0.05 GB/min. The standard bit rate is equal to the compression rate of a compression unit 15 which compresses a video stream which is to be recorded on a recording medium.

Therefore, when viewed in conjunction with the disclosure in lines 13-16 on page 12 of the substitute specification, the present invention clearly provides that the standard bit rate is a calculation parameter used for determining a bit rate corresponding to how a compression unit will compress a video stream that is intended to be recorded on a recording medium.

Furthermore, it must be emphasized that, as described in lines 13-16 on page 12 of the substitute specification, the standard bit rate is a fixed value that is prestored in a storage means or storage unit of the remaining recordable time calculation apparatus of the present invention at the time when the apparatus is shipped, i.e., when the apparatus is manufactured.

Moreover, the present invention provides that the estimate error value estimates at least one of an estimate error occurring during compression of a video stream, and a size of an unrecordable area inherent in the recording medium (see lines 1-6 on page 13 of the substitute specification). Furthermore, as described above, the estimate error value is also a fixed value that is prestored in a storage means or storage unit of the remaining recordable time calculation apparatus of the present invention at the time when the apparatus is shipped, i.e., when the apparatus is manufactured.

Claims 7 and 21 have each been amended to clarify that the standard bit rate of the present invention is a predetermined fixed value, that the estimate error value is a

predetermined fixed value, and that the fixed standard bit rate and the fixed estimate error value are prestored in a storage means (claim 7) or storage unit (claim 21).

While acknowledging that Browne et al. does not disclose, suggest or even contemplate how to calculate a remaining recordable time of a recording medium, the Examiner asserted that Kikuchi et al. teaches the above formula for determining a remaining recordable time. However, the Applicants respectfully submit that Kikuchi et al.'s formula is markedly different from the above formula recited in claims 7 and 21.

In particular, Kikuchi et al. determines a remaining recordable time by using the following formula.

$$\text{remaining recordable time} = (\text{free space of recording medium} - \text{recorded data amount} - \text{auxiliary amount}) / (\text{average recording rate})$$

(see Column 45, lines 18-31 and Column 61, lines 54-58)

Accordingly, Kikuchi et al. uses an average recording rate as a calculation parameter (see Column 45, lines 28-31), whereas claims 7 and 21 use a prestored, fixed standard bit rate as a calculation parameter for determining the remaining recordable time of a recording medium.

A standard bit rate, as recited in claims 7 and 21, is markedly different from an average recording rate, as disclosed by Kikuchi et al., in both purpose and effect.

In particular, the average recording rate of Kikuchi et al. is affected by a bit rate used in recording, where the bit rate used in recording is a variable value. The average recording rate of Kikuchi et al. takes different values each time a new remaining recordable time is calculated according to the recording/deletion of a program (video stream). Specifically, the formula used in Kikuchi et al. attempts to obtain a more accurate estimation of a remaining recordable time by dividing the remaining capacity of the recording medium by the average of recording bit rates actually used so far. However, since the average recording rate is variable, an increase/decrease in a remaining recordable time caused by the recording/deletion of a program will cause the calculated remaining recordable time to have a greater difference with the actual running time of a program.

On the other hand, the prestored, fixed standard bit rate recited in claims 7 and 21 is not affected by a bit rate used in recording, and therefore, always takes the same value regardless of the recording/deletion of a program.

Furthermore, the Examiner referenced Column 31, lines 18-24 of Kikuchi et al. in the Advisory Action to support his interpretation that the average recording rate of Kikuchi et al. corresponds to the prestored, fixed standard bit rate recited in claims 7 and 21. However, Column 31, lines 18-24 of Kikuchi et al. merely provides that the average recording rate can be recorded on a recording medium shortly after recording commences. This does not, however, alter the fact that the average recording rate of Kikuchi et al. is not a prestored or fixed value because the average recording rate of Kikuchi et al. is affected by a bit rate used in recording, where the bit rate used in recording is a variable value.

Moreover, the “recorded data amount” in the formula used by Kikuchi et al. is affected by a bit rate used in recording, where the bit rate is, again, a variable bit rate.

On the contrary, the “estimate error value,” “capacity of recording medium,” “running time,” and “standard bit rate,” which are the parameters used in the above formula recited in claims 7 and 21, are each free from any influence of a bit rate used in recording.

Owing to this feature of not including any calculation parameter that is susceptible to different values of the bit rate used in recording, the inventions of claims 7 and 21 have a remarkable advantage in that the increase/decrease in the remaining recordable time of a recording medium caused by the recording/deletion of a program will perfectly match the running time of the program. This advantage is not achieved or even contemplated by the technique of Kikuchi et al.

In fact, because Kikuchi et al. uses a variable bit rate, an increase/decrease in a remaining recordable time caused by the recording/deletion of a program will cause the calculated remaining recordable time to have a greater difference with the actual running time of a program.

For instance, assume the case where a recording medium has a remaining recordable time of 20 minutes, a capacity of 100MB, a standard bit rate is 5MB/minute, and an estimate error value of 0 (for the purpose of simplification). Also, assume that

nothing has been recorded so far in the medium so that the capacity of 100MB is equal to the size of the free space. Assume further that a program having a running time of 10 minutes, a data size of 40MB, and a bit rate used in recording is 4MB/minute is recorded to the medium.

Then, the remaining recordable time after recording the program will be calculated as follows according to the formula of Kikuchi et al. and the formula recited in claims 7 and 21:

Kikuchi et al.

$$(100-40-0)/5 = 12 \text{ min.}$$

Claims 7 and 21

$$[(100-0)/5]-10 = 10 \text{ min.}$$

Accordingly, as shown above, in a case where a ten-minute program is newly recorded to a medium whose remaining recordable time is 20 minutes, when a remaining recordable time is calculated by using the formula recited in claims 7 and 21, the decrease in the remaining recordable time perfectly matches the running time (10 minutes) of the newly recorded program (i.e.,  $20-10 = 10$  min.). On the other hand, when a remaining recordable time is calculated by using the formula of Kikuchi et al., the decrease in the remaining recordable time is shorter than the actual running time of the newly recorded program (i.e.,  $20-12 = 8$  min.).

The Applicants respectfully submit that the Kikuchi et al. reference is quite clear in its use of a variable bit rate. The Applicants respectfully request the Examiner to direct his attention to Column 45, lines 28-31 of Kikuchi et al., which was cited by the Examiner to support his interpretation that Kikuchi et al. discloses a standard bit rate. However, Column 45, lines 28-31 clearly shows that Kikuchi et al. uses an average recording rate, not a prestored, fixed standard bit rate as recited in claims 7 and 21.

Accordingly, the Applicants respectfully submit that Kikuchi et al. clearly does not determine a remaining recordable time of a recording medium by using a prestored,

fixed standard bit rate, since Kikuchi et al. clearly discloses that an average bit rate is used as a calculation parameter.

For at least the foregoing reasons, the Applicants respectfully submit that Browne et al. and Kikuchi et al. each clearly fail to disclose or suggest determining a remaining recordable time of a recording medium by using a prestored, fixed standard bit rate as a calculation parameter, as recited in claims 7 and 21.

Therefore, no obvious combination of Browne et al. and Kikuchi et al. would result in the inventions of claims 7 and 21 since Browne et al. and Kikuchi et al., either individually or in combination, fail to disclose or suggest each and every limitation of claims 7 and 21.

Furthermore, it is submitted that the clear distinctions discussed above are such that a person having ordinary skill in the art at the time the invention was made would not have been motivated to modify Browne et al. and Kikuchi et al. in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 7 and 21.

Therefore, it is submitted that the claims 7 and 21, as well as claims 8-13 and 22-27 which depend therefrom, are clearly allowable over the prior art as applied by the Examiner.

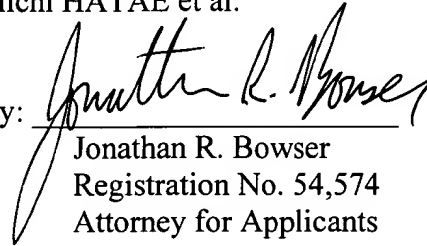
In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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